NCGW Bulletin 02-01

MICROBIOLOGICAL SAMPLING PLAN GUIDANCE DOCUMENT

Objective: The main objective of the sampling plan is to ensure that the water system collects and analyzes total coliform bacteria samples that represent the quality of the water in the distribution system. The routine sampling and testing of the treated water quality provides some assurance that the water being served does not present a health risk to the consumer.

Requirements:

- ?? A map of the water distribution system and/or building schematic for systems that has no other distribution system.
- ?? The number and frequency of routine coliform samples being collected as specified by the Colorado Department of Public Health and Environment. The more frequently that the water is sampled with negative results, the more confidence one may have that the water is bacteriologically safe.
- ?? A procedure for collecting the repeat samples in the event of a coliform positive routine sample including the location of the additional five routine samples required during the next month as well as the locations of the required repeat samples.
- ?? A list of the laboratories used by the public water system to provide analysis.
- ?? Sample preservation recommendations, maximum holding time, and the method used to ship the samples.

The system map must identify the source(s) of the water supply, all treatment facilities, all storage facilities, and all sample site locations routine and repeat. The water system map should include the water system name and system ID number. Sample water system maps are included in this guidance document (Attachment A) to assist you in the development of your system map.

In some cases, the entire water system may be contained in one building i.e. convenience store or gas station. In that case, the system operator should look for a representative sampling location that accurately reflects the water quality of the water used in that building. When selecting a sampling point, it is important to ensure that the sample location is in a clean environment. Consider protection from contamination by humans, animals, and airborne materials.

Avoid sampling locations that may pose a potential for contamination such as:

- ?? Garden hoses (possible surface contamination).
- ?? Faucets in a shallow sink, near, or below grade (The faucet or the ground should not touch the sample container when taking the sample).
- ?? Spigots with an aerator (aerator should not be allowed to remain attached to the faucet during sample collection),

- ?? Swivel joint faucets (can allow bacteria to grow where the faucet pivots and result in sample contamination).
- ?? Leaky faucets or faucets that allow water to seep around the valve stem may introduce contamination into the sample.
- ?? Faucets with threads can allow bacteria to grow in the thread grooves.
- ?? Faucets supplying dishwater in places such as cafes, janitorial sinks, or other sites with higher than usual possibly for bacterial contamination.

The following factors should be considered when developing a sampling schedule:

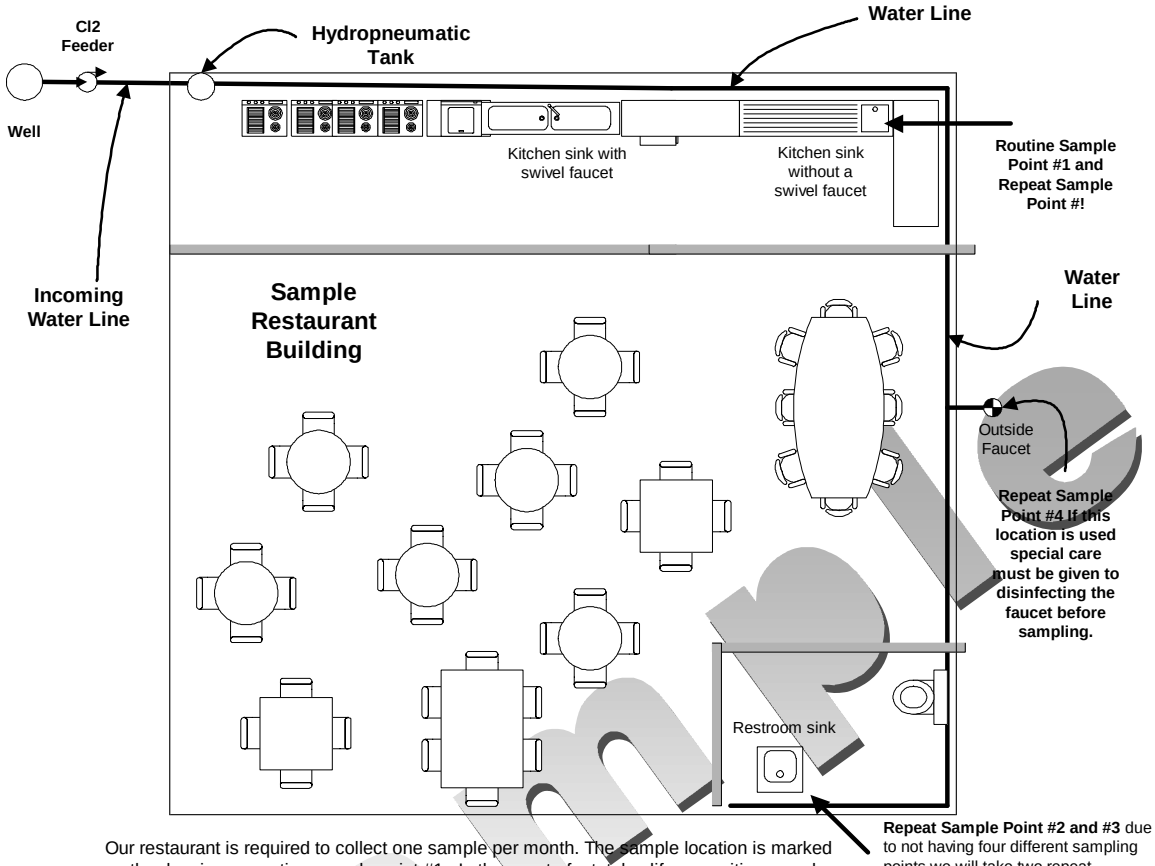
- ?? If collecting more than one routine sample, the samples should not be scheduled to be collected all on the same day. Rather, they should be spread out over the month to be more representative of the water quality during the entire month.
- ?? Chlorine residuals should be taken at the same time as the sample.
- ?? Samples should not be taken on Fridays. Most laboratories would not begin to analyze the sample until Monday and the samples would be too old.
- ?? If collecting only one sample schedule that sampling to occur early in the month to allow time for repeat sampling if necessary.
- ?? Water systems collecting one (1) sample per month or one sample per quarter must collect no fewer than four (4) repeat samples for each routine total coliform positive sample.
- ?? If a system collects less than five (5) routine samples per month, and one or more of those samples are positive for total coliform then the system must collect at least five (5) routine samples during the next month.

Rotation: When possible the samples need to represent the entire distribution system and should be rotated to different locations within the system. This method allows coverage for the distribution system without increasing the need for additional samples. Sample points should be uniformly distributed throughout the system.

Record Keeping: Record keeping is an essential part of operating a small water system. Records provide a documented history of your water system. This is particularly true of compliance records. For that reason, we have included a sample form (Attachment B) for your convenience to help track your sampling program analyses. Your microbiological analysis records must be retained for five (5) years and the chemical analysis records must be retained for ten (10) years.

The sampling plan should be posted in a convenient location for the operator or substitute operator to use and update and must be made available upon request of a local health department or WQCD representative.

Small System (Restaurant) Sample Monitoring Plan
PWSID # _____
System Name _____



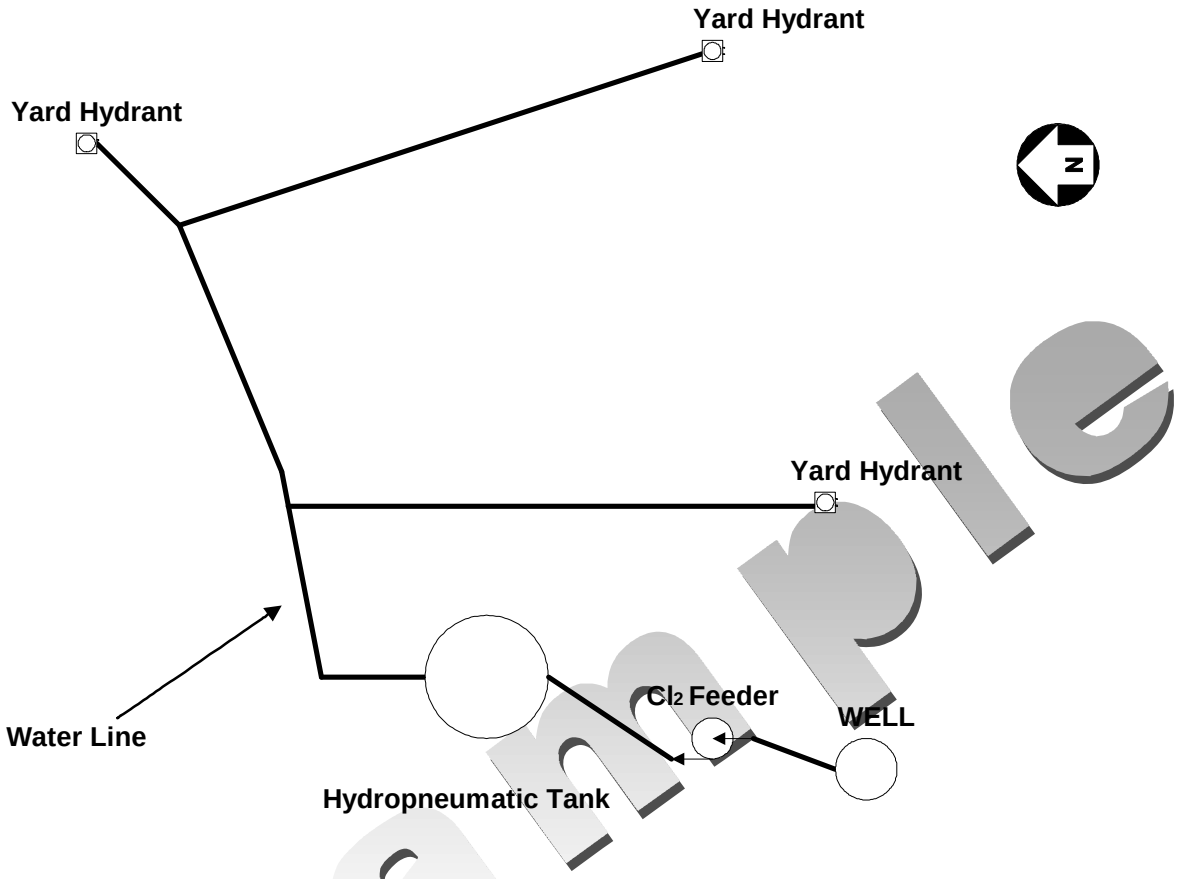
Our restaurant is required to collect one sample per month. The sample location is marked on the drawing as routine sample point #1. In the event of a total coliform positive sample we will obtain samples from our repeat sample points #1, #2, # 3, and (# 4 after disinfecting the outside faucet). We will obtain a set of repeat samples within 24 hours of being notified of the positive result. Our system would collect a minimum of four repeat samples for each total coliform-positive sample found. We will collect at least one repeat sample from the sampling tap where the original total coliform-positive sample was taken, and at least one repeat sample at a tap within five service connections upstream and at least one repeat sample at a tap within five service connections downstream of the original sampling site. If a positive sample is at the end of the distribution system, or one tap away from the end of the distribution system, our operator will contact the Department of Public Health and Environment for assistance. In the event of a total coliform-positive sample, our water system will collect five additional routine samples during the next month the system provides water to the public.

We use ABC laboratory in Denver, Colorado for our microbiological analysis. After flushing the water line and measuring the chlorine residual we collect our bacteriological sample being careful not to overfill or contaminate the bottle. The sample is placed in a cooler with ice to preserve for the trip to the laboratory. The sample must be delivered to the laboratory within 24 hours. Our sample is collected in the first week of month. After reviewing the results of our sampling we record the information on a sampling form and keep the laboratory slips for a minimum of five years (5) years.

Small System Campground Sample Monitoring Plan

PWSID # _____

System Name _____



Our non-community groundwater system is required to take one microbacteriological sample per quarter. The routine sample location is marked on the drawing. In the event of a total coliform positive sample we will obtain a set of repeat samples within 24 hours of being notified of the positive result. Our system would collect a minimum of four repeat samples for each total coliform-positive sample found. We will collect at least one repeat sample from the sampling tap where the original total coliform-positive sample was taken, and at least one repeat sample at a tap within five service connections upstream and at least one repeat sample at a tap within five service connections downstream of the original sampling site. If a positive sample is at the end of the distribution system, or one tap away from the end of the distribution system, our operator will contact the Department of Public Health and Environment for assistance. In the event of a total coliform-positive sample, our water system will collect five additional routine samples during the next month the system provides water to the public.

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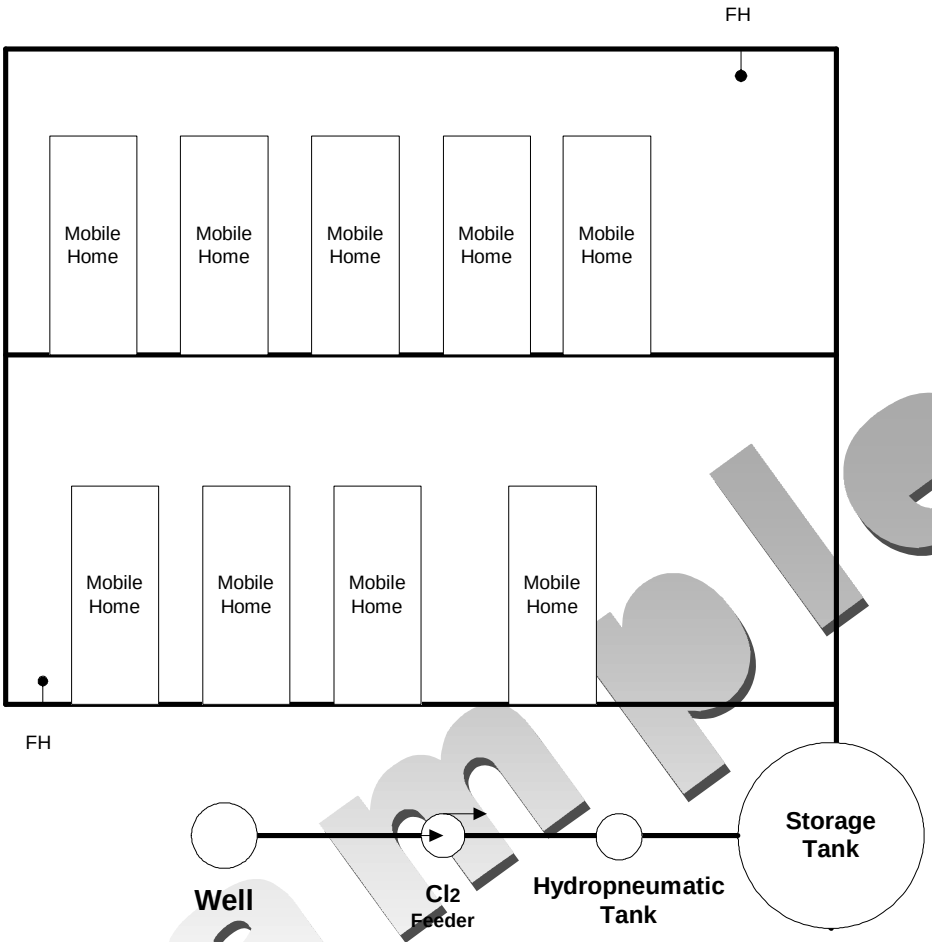
Small System (Mobile Home Park) Sample Monitoring Plan

PWSID # _____

System Name _____



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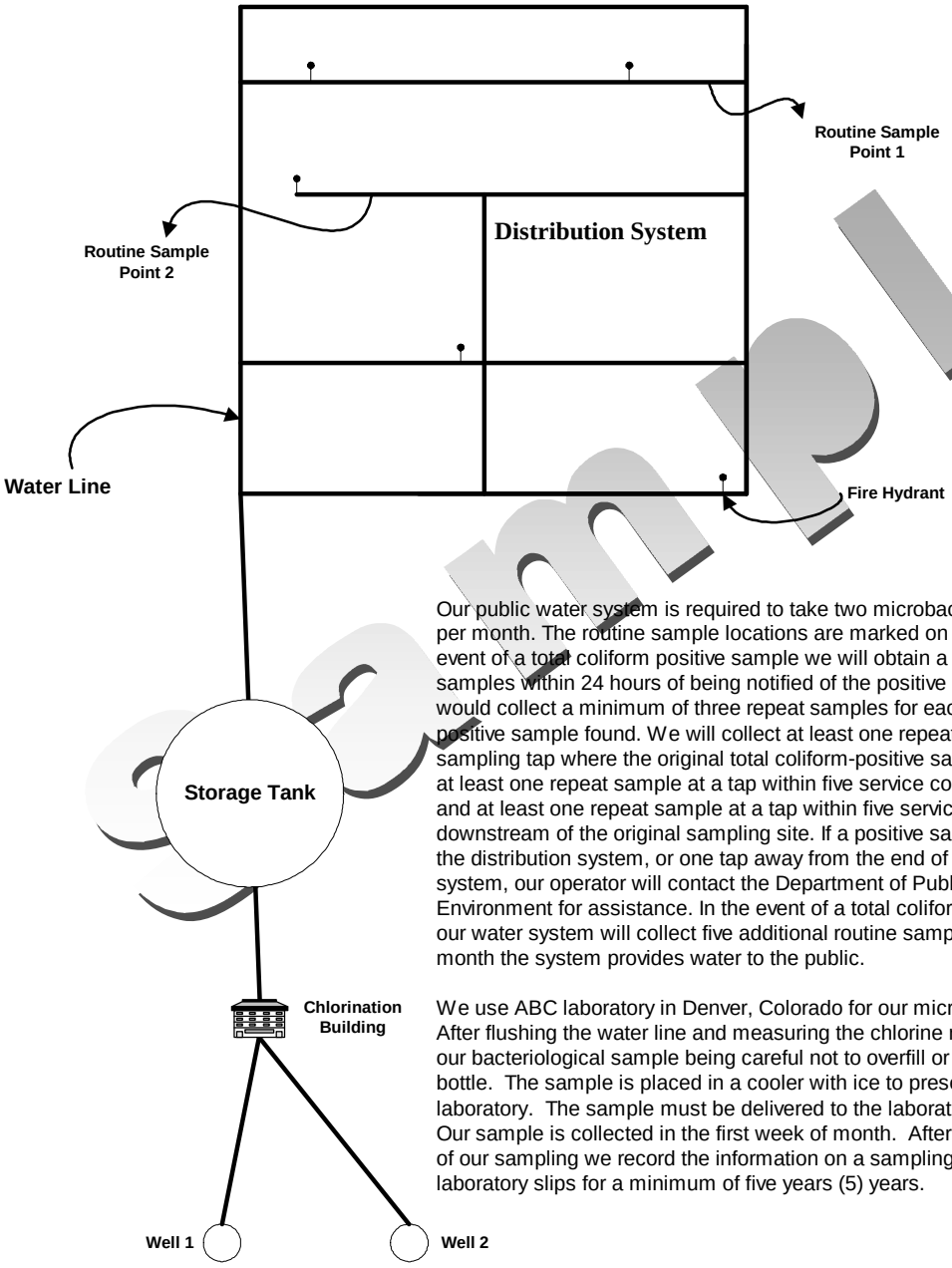
Small System Sample Monitoring Plan

PWSID # _____

System Name _____



Our public water system is required to take two microbacteriological samples per month. The routine sample locations are marked on the drawing. In the event of a total coliform positive sample we will obtain a set of repeat samples within 24 hours of being notified of the positive result. Our system would collect a minimum of three repeat samples for each total coliform-positive sample found. We will collect at least one repeat sample from the sampling tap where the original total coliform-positive sample was taken, and at least one repeat sample at a tap within five service connections upstream and at least one repeat sample at a tap within five service connections downstream of the original sampling site. If a positive sample is at the end of the distribution system, or one tap away from the end of the distribution system, our operator will contact the Department of Public Health and Environment for assistance. In the event of a total coliform-positive sample, our water system will collect five additional routine samples during the next month the system provides water to the public.

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